

FIVE YEAR REVIEW
LIQUID DISPOSAL, INC.
SHELBY TOWNSHIP, MICHIGAN

I. INTRODUCTION

A. Authority and Purpose

The U.S. Environmental Protection Agency (U.S. EPA), Region 5, conducted this statutory five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The purpose of a statutory five-year review is to evaluate whether a completed remedial action remains protective of human health and the environment at sites where hazardous waste remains on-site at levels that do not allow for unlimited use and unrestricted exposure. The Type I review conducted for this site is applicable to a site at which construction is complete and there are no factors which suggest a higher level of review is necessary. This review will be placed in the Site files and local repository for the Liquid Disposal, Inc. Superfund Site (the Site) in Shelby Township, Michigan.

B. Site History

The Site is located in Shelby Township, Macomb County, Michigan, about 3 miles northwest of Utica and 20 miles north of Detroit. The Site occupies approximately 6.8 acres of land and is bordered by the Clinton River floodplain 1/4 mile to the north, the Shadbush Tract Nature Study Area on the east, and auto salvage yards to the south and west. There is no use of groundwater in the area surrounding the site; however, 3,200 people live within one mile of the site. No groundwater wells are affected or threatened by the site. Previous uses of the site include sand and gravel mining and land filling. In 1968, a liquid industrial waste incinerator, Liquid Disposal, Inc., began operation at the site. Wastes received included PCBs, solvents, paints, laboratory wastes and various contaminated soils and wastes for incineration. Prior to incineration, wastes were stored in above ground and subsurface bulk storage tanks, drums, lagoons, and bottles. Numerous citations for violations were issued to the facility. LDI ceased operation in 1982 following the death of two people in an industrial accident.

The Site was proposed for the National Priorities List (NPL) on July 16, 1982 and finalized on September 9, 1983. During the period of 1982 through 1986, U.S. EPA performed four major removal actions at the site, including removal of 1.3 million gallons of liquids; 15,000 cubic yards of solids; 1,800 drums, and 30 storage tanks. The Michigan Department of Natural Resources performed the Remedial Investigation/Feasibility Study, which was finalized in 1987. The RI concluded that soils and other materials remaining on site were still contaminated with a wide variety of organic and inorganic chemicals. For example, in the former waste oil lagoon area, total organic compounds reached 17,332 mg/kg, mainly volatile aromatics, with xylenes most prevalent. In the scrubber lagoon area, Arochlor-1254 (a PCB) reached 69 mg/kg, cadmium 83 mg/kg and lead 9,910 mg/kg. Off-site groundwater was found to be contaminated with a

similar variety of compounds. Nearly all individual organics were found at levels less than 40 ug/l. Exceptions include acetone at 490 ug/l and 4-methyl-2-pentanone at 99 ug/l. Of the inorganics, only barium significantly exceeded drinking water standards, at 3,900 ug/l. The contaminants in the on-site soils led to a Hazard Index of 74.4 for direct contact by children and a maximum potential carcinogenic health risk of 1×10^{-6} . The contaminants in off-site groundwater led to a Hazard Index of 13.7 for ingestion by child or adult and a maximum potential carcinogenic risk of 1×10^{-5} .

The Remedial Design and Remedial Action were performed by a PRP group pursuant to a Consent Decree, United States v. BASF Wyandotte Corp. et al., No. 89-CV-71180-DT (E.Dist., So. Div. MI), entered on December 20, 1989. Under this consent decree, 41 major PRPs, and 494 de minimis PRPs agreed to fund and to perform the remedial action. Additional funding for the remedial action came from another 325 de minimis parties who settled with the United States in a consent decree entitled United States v. A.N. Reitzloff Co., et al., No. 90-CV-71414-DT (E.Dist., So. Div. MI), which was entered in August 1990.

II. DISCUSSION

A. Remedial Objectives

The remedial action goals of the ROD were to minimize risks to public health and the environment from direct contact with contaminated materials, to minimize further migration of contaminants to groundwater and surface water, and to clean up any contaminants that may have already migrated off-site. A ROD was signed for the Site on September 30, 1987, which required:

- * Demolition of structures and equipment on site;
- * Consolidation of soil and debris on site and solidification using cement or a similar substance to immobilize wastes in the soil;
- * Construction of an underground slurry wall around the site to restrict migration of groundwater onto or off of the site;
- * Construction of an impermeable cap over the site to impede infiltration;
- * Installation and operation of leachate extraction wells inside the slurry wall to remove groundwater trapped on-site under the cap and any groundwater entering the site through the cap or slurry wall in the future; disposal of the groundwater off-site;
- * Removal of off-site soils above target cleanup levels and containment with on-site soils; and

- * Installation and operation of extraction wells off-site to capture any groundwater contamination which may have migrated off-site.

New information received during the Remedial Design phase led U.S. EPA to review the selected remedy for treatment of off-site groundwater and for total site solidification. Based on this new information, U.S. EPA concluded that the remediation of off-site groundwater envisioned by the ROD had occurred and was continuing to occur through natural attenuation. An Ecological Risk Assessment confirmed that off-site groundwater contamination levels were no longer high enough to produce a negative ecological impact. Taking into consideration the extensive removal work at the site and the improved state of off-site groundwater, U.S. EPA determined that total site solidification and extraction and treatment of off-site groundwater were no longer necessary. U.S. EPA issued a fact sheet and held a public meeting to give the public the opportunity to comment on the proposed changes.

On August 28, 1995, U.S. EPA issued an Explanation of Significant Difference to document the following modifications to the ROD:

- * Groundwater extraction off-site will not be implemented unless U.S. EPA finds that off-site groundwater quality has deteriorated as a result of site-related contamination.
- * Rather than total site solidification, a 20 foot-wide swath around the perimeter of the site will be solidified down to the clay layer and all highly contaminated soils and materials encountered during remedial activities will also be solidified and contained on-site.

B. Remedial Action

On-site construction began December 7, 1992. The following activities were conducted:

- * Demolition of structures and equipment on site;
- * Removal of off-site soils and consolidation with on-site soils;
- * Solidification of a 20 foot-wide swath of perimeter site soil and of selected other areas of highly contaminated soil and debris on-site;
- * Construction of an underground slurry wall around the site;
- * Construction of an impermeable cap over the site; and
- * Installation and operation of leachate extraction wells inside the slurry wall.

U.S. EPA and the State conducted a pre-final inspection on August 15, 1996, which included a description and schedule for correcting remedial action items by the contractor. These items included demonstrating the integrity of the slurry wall and improving the groundwater extraction system inside the slurry wall. These items were completed in August 1997 and U.S. EPA conducted a follow-up inspection on September 4, 1997. In a Preliminary Closeout Report (PCOR) dated September 15, 1997, U.S. EPA determined that the Remedial Action activities were completed. Follow-up items identified in the PCOR were:

- * Submittal of Construction Completion Report and final Operation and Maintenance Plan by the PRP group;
- * Continued operation and maintenance by the PRP group, including cap maintenance, internal groundwater extraction and off-site disposal, on and off-site groundwater monitoring, and monitoring of revegetated areas.

The Construction Completion Report and final Operation and Maintenance Plan were submitted to U.S. EPA and MDEQ and are currently under review.

B. ARARs Review

The remedy performed for the Liquid Disposal, Inc. Site complies with the performance standards selected in the ROD and ESD. These standards remain protective of human health and the environment. The U.S. EPA believes that the clay cap over the site and the slurry wall surrounding the site comply with all performance standards and ARARs, although the Construction Completion Report has not yet been approved. The cap appears to comply with RCRA Subtitle C and 40 CFR Part 264, and with the Michigan Hazardous Waste Management Act (Act 64) and is fully adequate to prevent significant amounts of water from infiltrating into the site and to protect against direct contact with the remaining wastes.

The ROD also required the installation of a leachate extraction system within the site. The approved Remedial Action Plan for the site specifies that the extraction system be sufficient to establish and maintain a 2-foot inward differential in groundwater levels across the wall. The current extraction system is in general making satisfactory progress toward this differential; however, the extraction rate has recently been seriously slowed due to iron bacteria clogging. Approved acid treatments for the extraction wells are underway, but have been slowed by the warm weather. Despite this, the system is expected to be sufficient to meet the Action Plan's specification within 1 to 2 years. The extracted leachate is pumped automatically to a 5,000 gallon tank, which is pumped out and trucked off-site for disposal once a day. The leachate is currently non-hazardous.

The cleanup standards in the ROD and ESD also remain adequate to protect groundwater and surface water. The ROD established target cleanup levels (TCLs) at the Maximum Contaminant

Level (MCL) or background level, whichever is higher. For contaminants for which there was no MCL available at that time, the TCL was set at a risk level of 10^{-6} for carcinogens or a Hazard Index of 1 for non-carcinogens. Some elevated background concentrations were acknowledged in the ROD, especially for VOCs. The following table shows the contaminants and TCLs which were listed in the ROD, the current MCLs, and the current contaminant levels:

<u>Analyte</u>	<u>ROD TCL (ug/l)</u>	<u>Current MCL (ug/l)</u>	<u>Current Downgradient High (ug/l)</u>
barium	1000	2000	2900 (MW11)
cadmium	10	5	ND
chloroform	0.1	100	ND
benzene	0.2	5	ND
methylene chloride	1	5	ND
trichloroethylene (TCE)	0.8	5	ND

Except for barium at two locations (MW111 at the north side of the slurry wall and MW4 downgradient well), groundwater downgradient of the site currently meets MCLs and the target cleanup levels listed in the ROD. A report submitted in October 1996 by the PRP group confirms that natural attenuation, mainly biodegradation, continues to effectively lower organic contaminant levels downgradient of the site. It is less certain what will happen to the barium through time. The site is a significant source of barium (up to 17,000 ug/l, perhaps from gypsum construction debris) and until the inward hydraulic gradient is established in 1-2 years, some may be moving through the slurry wall. However, the source of the barium in the groundwater may also be from dissolution of naturally occurring barite. Presently, barium levels are decreasing as groundwater flows farther from the site, suggesting that barium is precipitating out as the geochemical conditions change downgradient of the site. Whether this process will eventually lead to barium reaching the MCL everywhere downgradient of the site is unknown at this point and depends on possible upgradient sources of barium and whether the major downgradient source is the site or naturally occurring barite.

Groundwater at the site is not being used as a source of drinking water and is not likely to be used in the future because the land between the site and the groundwater discharge point at the Clinton River is part of the Rochester-Utica Recreation Area and the Shadbrush Tract Nature Study Area. The groundwater discharge at the Clinton River meets the surface water quality standards of the ROD and current standards.

III. Recommendations

I recommend continued maintenance of the clay cap and the revegetated area and continued operation and maintenance of the leachate extraction system and the groundwater and slurry wall

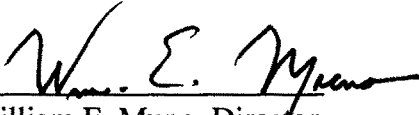
monitoring systems. I recommend further that the site be deleted from the NPL when 1. the required hydraulic gradient across the slurry wall has been reached and 2. groundwater quality reaches the ROD cleanup standards (or if it is established that certain standards will not be met due to naturally occurring minerals).

IV. Statement on Protectiveness

I certify that the remedies selected for this site remain protective of human health and the environment.

V. Next Five-Year Review

The next five-year review will be conducted by December 7, 2002, which is ten years from the date of on-site construction mobilization at the Site (December 7, 1992).


William E. Muno, Director
Superfund Division

2/23/98
Date